DOCUMENT RESUME

ED 095 904 IR 001 087

AUTHOR	Grise, Philip J., Jr.; And Others
TITLE	Educational Radio: A Review of the Literature.
INSTITUTION	Florida State Univ., Tallahassee. Center for Educational Technology.
PUB DATE	74
NOTE	51p.
EDRS PRICE	MF-$0.75 HC-$3.15 PLUS POSTAGE
DESCRIPTORS	*Correspondence Courses; Cost Effectiveness; *Developing Nations; *Educational Radio; Educational Television; *Instructional Media; Literature Reviews; Longitudinal Studies; Radio Technology; State of the Art Reviews
IDENTIFIERS	*Accion Cultural Popular; ACPO

ABSTRACT

Radio has been used for educational purposes since its beginning in the early 1920's; the application of radio to the educational problems of the developing nations is not a new concept by any means. Among the uses of educational radio are foreign radio schools, classroom radio uses, "Accion Cultural Popular" (ACPO), and correspondence radio courses. Educational radio for classroom presentation has been demonstrated as effective as television, slide/tape presentations, and other media, and to be cost effective. The great gains in learning shown in radio lessons might be further enhanced by using materials designed specifically for radio use rather than applications of modified scripts from other media. Other areas of need are those of longitudinal studies concerning the effects of radio used over an extended period of time, and studies of single-session attention span of students. (Author/WH)

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EDUCATIONAL RADIO: A REVIEW OF THE LITERATURE

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Center for Educational Technology
The Florida State University
Tallahassee, Flor[illegible]da
1974

IR 001 087

ABSTRACT

Educational Radio: A Review of the Literature

Radio has been used for educational purposes since its beginning in the early 1920's. The application of radio to the educational problems of developing nations is not a new concept by any means. Most developing nations have broadcast capabilities to cover their geographic region. The main technical problem is the absence of receivers for all people. Some countries have governmental problems in allowing the import of transistors or radios for use by the populace. Additionally, radio broadcast technicians and educational radio format designers are very scarce in developing countries and academic programs need to be created on a large scale.

Among the uses of educational radio that are discussed in the review are foreign radio schools, classroom radio uses, ACPO, and correspondence radio courses. The comparative costs of radio to other media are also examined.

Those studies of the effect of educational radio since the 1930's often use materials not developed specifically for radio use. Educational radio for classroom presentation has been demonstrated as effective as television, slide/tape presentations and other media. The great gains in learning shown in radio lessons might be further enhanced by using materials designed spedifically for radio use rather than applications of modified scripts from other media.

Other areas of need are those of longitudinal studies concerning the effects of radio used over an extended period of time, and studies of single-session attention span of students.

REVIEW OF LITERATURE

Radio has been used for educational purposes since its beginning in the early 1920's. The application of radio to the educational problems of developing nations is not a new concept by any means. Most developing nations have broadcast capabilities to cover their geographic region. The main technical problem is the absence of receivers for all people. Some countries have governmental problems in allowing the import of transistors or radios for use by the populace. Additionally, radio broadcast technicians and educational radio format designers are very scarce in developing countries and academic programs need to be created on a large scale.

Those studies of the effect of educational radio often used materials not developed specifically for radio use, instead the materials were usually for classroom presentation or even ITV. The great gains in learning shown in radio lessons might therefore be even further enhanced by using materials designed specifically for radio use (see McLuhan).

Other areas of need are those of longitudinal studies concerning the effects of radio used over an extended period of time, and studies of single-session attention span of students.

Overview

Historical Background

During the 1930's and 40's most of the activities in educational radio were conducted through universities. Wagner (1939) provided a summary

of the most important work being done at that time. The following works cited are included in his summary.

At Kansas University, one of the pioneers in the field of giving classroom instruction in radio broadcasting, courses dealing with the program side of radio have been available to students since February, 1932. From the beginning, emphasis has been placed on training students for educational rather than for commercial broadcasting.

Ohio State University's "Evaluation of School Broadcasts" was a study sponsored by the Federal Radio Education Committee and involved the active cooperation of educators and of network and independent broadcasters. The major purpose of the undertaking was to gather evidence regarding the effectiveness of radio broadcasts, planned for use in school, in achieving a variety of educational objectives which broadcasters and teachers alike considered important.

The Research Project in School Broadcasting being carried on by the University of Wisconsin was to determine, through demonstration and evaluation, the place of radio in the classroom and to devise methods for its most effective use. During the seven years of experimentation in school broadcasting, the Wisconsin School of the Air has had a steadily increasing audience. The purpose of school broadcasts was to supplement and enrich rather than to give curricular instruction.

The School of Public and International Affairs at Princeton University established an Office of Radio Research in September, 1937. At that time a Rockefeller grant was secured to finance a radio research project to

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be carried out by this office. A series of publications about the project was planned and, as the work of the project proceeded, a number of basic principles of procedure were formulated.

In the spring of 1937, Wayne University started an experiment to develop a radio research technique for measurement of listening habits which would be inexpensive and yet fairly reliable, and one which might best be carried out through the schools.

At the University of Mississippi, a questionnaire was formulated for the study of radio listening habits, effects of listening, and attitudes toward radio programs and governmental control of radio.

Research done at St. Andrews University, Scotland, involved collecting questionnaire responses for groups of British listeners. The results reveal significant differences in program preferences among occupational groups.

Fisk and Lazarfeld (1945) introduced the work of the Office of Radio Research, a division of the Bureau of Applied Social Research in Columbia University. They also illustrated the interrelationship of radio and other fields of communications research. The Office conducted research on the roles of radio from the standpoint of the educator, psychologist, and sociologist. Special attention was directed to the techniques of radio research, including surveys of listening habits and more specialized research pertaining to the effectiveness of one section or element of a program.

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Special characteristics of radio were explained. Fiske and Lazarfeld said that there are at least six characteristics of radio which distinguish it from other media. The most significant characteristic is radio's accessibility; another one is its auditory perception. Its accessibility, combined with its reliance on auditory perception, enables people to listen while carrying on a variety of other activities which do not necessarily interfere with their perception. But, at the same time, this quality of non-interference leaves the radio program liable to a low degree of attention. A fourth characteristic of radio is that it continues in time. Cumulative effects can be built up over long or short periods. Also, a national network may reach into homes all over the country if it confines its appeal to a general one.

Recent Reviews

Recent surveys of the uses of instructional radio can be found in Jamison, Suppes, and Wells (1972), Forsythe (1970), and Lynch (1966). Further information is available in Madden (1968), a comprehensive bibliography with 432 references; a more selected bibliography prepared by Educational Technology in 1969, and in Sparks (1970), a bibliography of doctoral dissertations in television and radio, listing over 900 titles.

Jamison, Suppes, and Wells provided a history of the use of educational radio in the United States and abroad, followed by a description of a number of experimental studies designed to show the

effectiveness of radio as an instructional medium. They concluded that although radio has been used extensively for formal classroom instruction, there are only a limited number of good evaluations of its effectiveness. "These evaluations indicate that instructional radio (supplemented with appropriate printed material) can be used to teach most subjects as effectively as a live classroom instructor or ITV."

In a review of some forty-one articles on educational radio, Forsythe (1970) covered the span of application of radio in American education and highlighted some international projects. He noted that the greatest use of radio for instructional purposes occurs in the United States, Sweden, Japan, and Canada.

Some characteristics and uses of radio identified in the review include:

1. The ability to present students with events as they happen. Radio can be combined with visual elements to create an emotional impact which may heighten the effectiveness of instruction.

2. Radio provides listeners with a sense of involvement and allows the listener to hear authorities or programs that are beyond the scope of the typical school system.

3. Radio may be used jointly with other media such as television. Multiplexing offers the opportunity to use single-image facsimile transmission or the use of electrowriters.

4. Radio is capable of copying almost all educational projection

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that television can do, and at substantial lower production and reception costs.

5. Other services offered include; in-service teacher training, continuing professional education, community service, health and vocational education, etc.

Forsythe concludes that radio has been shown to be an effective medium, through extensive research. In fact, radio has been shown to be as effective as "conventional methods." Furthermore, the use of additional visual materials with instructional radio has not been uniformly helpful and in some cases is actually harmful. Essentially, Forsythe cites that no research has proven that multiple channel communication is more effective than a singular mode (radio).

Lynch (1966) included articles by over forty authors concerning the uses of radio and television in the secondary school. Parts one and two provide the historical perspectives of commercial and educational radio and television. Part three concerns the use of radio and television for enrichment or basic education. Part four discusses future uses of these media and Part five offers suggestions for needed additional study on the effectiveness of radio and television in the school.

Current Status

Sandler (1967) discussed the re-emergence of radio as an instructional medium and the rediscovery of some of the features that make radio particularly appropriate for certain purposes. He pointed out that with

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the rise of ETV, radio had to re-establish itself as a viable medium. That it has done so, can be seen in the growth of FM educational stations, in the use of new techniques such as multiplexing, in the wide range of broadcasting offered, and in the creation of National Educational Radio in 1964.

From a 1966-67 survey, a status report was made on educational radio by Land Associates, Inc. (1967). As of April, 1967, 346 educational radio stations existed in the United States; 244 in colleges and universities, over 50 in public schools, and 37 operated by other groups.

Over 50% of the stations had budgets of less than $20,000 a year; 1% had budgets of over $600,000. 77% report that they are inadequately staffed and are confronted with problems caused by disinterested school administrators, lack of facilities, and weak promotion.

Little is known about the stations' listening audience. Over 50% conducted no audience research or research on the effectiveness of programs. Most of the research was done by school district stations.

Programming in educational radio includes public affairs, community affairs, service to special audiences, news, general education, in-school instruction, agriculture, and cultural enrichment. The National Educational Radio Network supplies programs to its affiliated stations in seven categories: 1) current information and orientation, 2) physical sciences, 3) social sciences, 4) art and literature, 5) mental and physical health, 6) music, and 7) programs for children. The network also has in-school offerings for use in kindergarten through the 12th grade.

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Young (1970) conducted a survey of public radio in the United States. The article described problems in budgeting and personnel, and discussed trends evident in public radio over the past few years.

Possible Uses

One of radio's greatest strengths is the diversity of programming possible. In addition to direct instruction, in and out of the classroom, radio has been used to provide supplementary material, aid in motivating students, and increase community awareness and involvement.

Dreyfus (1966) suggested uses and gave examples of educational radio and television in direct instruction, where the materials are an integral part of the teaching-learning process, as supplementary materials, prepared for use within the context of a course or curriculum, and as enrichment materials not specifically related to the instruction.

Hilliard (1968) in an address to the annual college conference of the International Radio and Television Society pointed out the potential for radio and television in urban ghettos using innovative techniques. He also emphasized the importance of radio for international communications.

Burrow, et. al., (1969) reported on the use of radio in conjunction with an already existing booklet and a tutor system to train factory shop stewards in human relations.

A report by the Corporation for Public Broadcasting (1970) describes phase one activities of the Public Broadcasting Environment Center. The Center is engaged in efforts to apply the capabilities of public

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broadcasting to environmental education.

In an effort to increase possible applications, radio has attempted to make use of innovative technology. Cosford (1969) described "radiovision," a coordinated radio broadcast-color filmstrip medium. The emphasis in his article is on "radiovision's" applications to the learning process. Jamison (1968) described the economic and technical attractiveness of satellite-based radio instructional systems.

International Applications

Multinational Reviews

Instructional radio has been used extensively in developing countries. While there has been little empirical research, there is a substantial descriptive literature.

W. Hugh Walker pointed out in an address to the 1969 International Conference on Arid Lands in a Changing World, that radio could be used as an effective instrument of instruction, especially in adult education, in areas isolated from urban centers.

The importance of radio as an instructional medium had been previously pointed out in the 1967 European Broadcasting Union's International Conference on Educational Radio and Television. The more than 600-page final report discussed applications of instructional radio from all parts of the world and included detailed descriptions of exemplary programs.

DeFever (1971) suggested several guidelines for success of rural agricultural broadcasting programs:

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1. Rural broadcasts must be made regularly and on a continuous basis, on fixed days, in order to induce the habit of listening.

2. Programs should be on the air at fixed times, convenient for farm listeners, usually at night.

3. The subjects dealt with should be topical, and

4. Broadcasts should be presented as far as possible, by the same person.

Riitho (1971) described uses of radio which offer some obvious advantages as a communication medium for family planning education in Africa. The program consisted of various broadcasting in such formats as short messages, spot announcements, interviews, panels, talks, etc.

In introducing the content, local customs, holidays, and taboos were considered. Problems included getting the villagers used to fixed schedules, nationwide scheduling, the uniqueness of the radio, and the fact that only 6% of the population owned a radio.

UNESCO has been very active in exploring the use of radio in developing countries. In a study of radio and television in Asia, some of the conclusions drawn were that radio can be an instrument to promote social and economic development and expand the educational systems of less developed countries. According to the 1967 UNESCO report this is due to the independence from traditional ground communication, instant and flexible production, emotional and intellectual appeal, individual or group participation, cheapness of production and reception, lack of

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necessity for electricity and personalism. This is especially true for Asian countries which are characterized by small percentages of economically active individuals, moderately large percentage of school age populations, irregular distribution of educational facilities and opportunities, scattered distribution of persons in these countries, and wastage.

The potential of educational radio to meet the needs of the entire Asian population has not been developed. The cost of broadcasting drops when used on a large scale when its assets are fully used, rather than when used on a small scale to supplement instruction. However, Asian countries have used educational broadcasting only on a small scale. The majority of this radio time is devoted to secondary school education followed by primary school broadcasts, with few hours devoted to vocational training and pre-school programs.

UNESCO (1956) has also supported studies of cultural radio broadcasts. The results of their experiences show that cultural broadcasts have attempted to popularize knowledge in general and also to attract the more sophisticated audience. In both cases, countries have aimed at the highest standard of performance.

Programming in all cases covers a multitude of subject areas such as national literature, history, science, music, economics, and religion.

Great Britain, Germany and Palestine have attempted to appeal to the most intelligent audience, assuming a prior knowledge of the subject.

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The Soviet Union, India, Rumania, Egypt, Italy, and Poland broadcast in various subject areas but with an aim for a larger, less specialized audience.

It has been pointed out that programs now used in other countries would probably be successful in Asia due to the high Asian regard for knowledge and education. John Morris, head of the BBC Third Programme, feels that material incomprehensible to westerners without the printed page would be readily absorbed by the Asian people who are accustomed to absorbing knowledge by ear.

Radio Forums

One of the most important uses for radio in developing countries is the radio forum or radio club. The model for most forums is the Citizen's Forum in Canada. India has been the leader in adapting the Canadian model for developing countries. Recently, efforts have been made to expand the forum's possibilities through the use of two-way radio.

Mackie (1968) presented a history of the Citizen's Forums in Canada from 1943 to 1963. He pointed out that successful educational radio depends on skilled field leadership, extensive promotional activities, and continuity in format and broadcast time.

Hindley (1972) discussed the radio and visual education network developed in Canada for their Indian and Eskimo populations. The system uses two-way signal side band radio on the reservation under

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the direction of the Indian people. The article also discussed possible applications to urban areas where people suffer from lack of information.

An overview of the Radio Rural Forum in India is provided in Schramm (1967). He discusses the original Poona pilot project conducted in 145 villages in 1956. The project was well staffed and a detailed evaluation was conducted by the Tata Institute in Bombay. Conclusions reached by the evaluation team indicated that there was significant learning by forum members, that villages with forums were more active than non-forum villages in starting community projects, and that the forum was beneficial to the illiterate as well as the literate members of the community. After the conclusion of the Poona project the forums continued on a nation-wide basis. Schramm points out that although the forums are considered generally successful, none have come up to the standards reached at Poona. Reasons include insufficient funds and personnel, and the great difficulties experienced in such a widespread effort. Nevertheless, India's experiences provide important lessons in the use of radio as a force for community awareness and involvement in developing countries.

Sitaram (1969) completed a study on whether radio increased the awareness level of the rural Indian population. He found that awareness of political, cultural, religious and family issues was greater in villages with radios than in those without radios.

Jain (1969) investigated theoretically and empirically the functions of group radio listening, discussion, decision, commitment, consensus

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on the effectiveness of Indian radio forums. Theoretical conceptualization of radio forums and the predicted role of group discussion, group decision, and the public commitment is rather well supported by the data. However, he was not able to demonstrate the usefulness of private commitment and group consensus.

Kahnert (1967) reported on the regular broadcasting of an educational radio program for adults in Togo, where villagers gathered in listener's clubs under the direction of a club leader to hear and discuss the programs. The programs which were broadcast were in French and two of the local dialects, covered five general content areas.

The project began in 1964 and by the end of 1966 had more than 1,000 active clubs participating. There has been no formal evaluation of the project, however, it appears that despite difficulties due to financing, coordination, and communications with club leaders, a meaningful dialogue has been established between the administrators and workers in the villages.

A study of the Farm Radio Forum Project of Ghana was conducted by Abell (1965). This project was carried out in eighty villages divided into four groups; two experimental and two control villages. Through pre and post broadcast questionnaires, it was found that the listening groups contributed to villagers' comprehension of inter-village cooperation, formation of cooperatives, and food nutrition.

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LeFranc (1967) reported that Niger is conducting an experiment in the use of radio to improve communications between the villagers and the administration. Broadcasts and follow-up club discussions deal with topics in education, social awareness and civic awareness.

The project emphasizes a strong feedback and evaluation system and programming reflects needs identified by the clubs. Despite initial problems of a cultural nature which include shyness in front of a microphone, lack of strong village chief support, and fear on some local governmental levels, the program has become an important part of village life.

The extension of the forum through the use of two-way radio in Senegal is discussed in an article by Cassirer (1970). Broadcasting in Senegal has become more than an instrument for the dissemination of information, entertainment and instruction. Through this two-way communication medium villagers have begun to assume an active political role in the country.

Radio Schools

"Accion Cultural Popular" (ACPO), was established in Colombia in 1947. Broadcasting as "Radio Sutatenza" it has become the most important institution in the field of popular education in Colombia and is a model for the promotion of rural development in all Latin America. ACPO (1972) now comprises 250,000 registered students, and nearly 20,000 radio schools throughout the country.

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Primarily directed toward isolated peasants, ACPO provides a fundamental and integral educational system. Schools are founded and organized by local peasant leaders who receive training in two special institutes located at Sutatenza and Calias. Radio broadcasts provide special educational programs for the schools as well as entertainment, radio theater commentaries, news, and music. There are also five instructional booklets, a weekly newspaper, and a Peasant Library offering low cost opportunities for the peasants to practice and improve their acquired knowledge.

Esteban Musto completed an in-depth study of ACPO in June, 1971, under the auspices of the Deutsches Institut fur Entwickslungspolitik. His results indicate that ACPO has led to important improvements in the life of the peasants.

> The results of the field study are not sufficient to evaluate, in a strict sense, the educational activities of ACPO. Nevertheless, they are sufficient to draw some relevant conclusions regarding the structure of the scope and character of influence exercised by the institution. The radio schools exercised their greatest impact in the field of explicit behavior of peasants and not in the field of teaching to read and write or in the attack on the traditional mentality.... Investigations confirm that ACPO has achieved great improvements in the level of subsistence economy. Its latent effects may contribute to the encouragement of other public and private ideas to promote rural development.

Research completed in April, 1972, by Stephen Brumberg, funded by the World Bank, provides an excellent overview of ACPO's experiences. Some of the findings were:

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1. A mass media educational program coupling radio, printed materials and local staff appears to be effective in teaching campesinos (peasants) to read and write.

2. Multiple media must be employed in a coordinated manner, and personal contacts must be eliminated.

3. The educational content of a mass media program needs to be practical and motivational, applicable and applied.

4. In a mass education program that seeks to treat the "whole man" a clear ideological stance is important.

5. A mass education program must gain the support and approval of the local power structure if it is to be effective within given communities.

6. Mass media educational programs require effective feedback mechanisms to ensure that the right messages are being broadcast, that they are being accurately perceived, that a loyal listening audience is being built up, and that the learning offered is put into practice.

7. A mass educational program is a long term effort and depends in large part on the presence of other development inputs into rural communities.

"In large part, ACPO demonstrates the effectiveness of a mass media based educational program as a major complement in rural development efforts."

Radio schools based on ACPO have been established throughout Latin America and many of these organizations rely on Sutatenza for training and help. Representatives from Latin American countries, Canada, and

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West Germany attended an ACPO sponsored conference in September, 1972, at which an international organization of radio schools was established.

Accion Cultural Popula Hondurena (ACPH), Honduras, uses radio for literacy and basic education training. (Lyle, 1967) Beginning and advanced cycles are offered using radio as the primary instructional mode with adjunct textbooks for literacy and arithmetic. Results of the experiment have been encouraging, however, problems in organization, financing, repair, and control of examinations, made it difficult to draw firm conclusions about the program's effectiveness.

Classroom Uses

In addition to the special attention given to radio forums and schools, experiments with radio for use in the regular school system have been carried out throughout the world.

A comprehensive look at the system in Thailand was reported by Schramm (1967). Educational radio which began in Thailand in 1958, has been favorably received. Programs are broadcast for grades one through ten for teachers, and there is a home program aimed primarily at parents. Teachers are supplied with scripts of the programs and instructional guides.

Koomsai and Ratanamangkala (1960) conducted a series of controlled experimental studies in Thailand schools. Student performance was significantly improved in the areas of music and social studies. Although no significant difference was found in the two grades tested for ability to

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understand spoken English, there were differences shown in the students' ability to write English. Since the experiments Thai officials have greatly revised the English programs.

Kenya has used radio in teaching science in the upper primary grades since 1964. Ball (1971) described the development of the project and identified problems and steps taken to solve them. Studies have been conducted concerning the children's attention span and techniques have been developed for getting the children's attention and coordinating the broadcasts with pamphlets and simple experiments. Eighty percent of Kenya's upper primary children are currently using the broadcasts.

Hulsen (1967) reported that radio education in Korea began in 1951 as an emergency wartime measure. School participation was low partly because only fifty to fifty-five percent of the schools were equipped with suitable receivers and partly due to pressure of the National Middle School Examination which put great emphasis on facts and rote memorization.

In Italy radio is used to supplement classroom instruction in primary and secondary schools. Guarrera (1972) provided a description of the program and reported results of a survey to determine the extent to which radio was being used. A periodical is regularly sent to teachers describing upcoming broadcasts. The results of the survey indicated that 68% of Italian primary schools and 36% of the secondary schools use the broadcasts. It was also found that rural and small urban areas make the most use of radio.

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Correspondence

Radio as a regular part of correspondence study has been used in Japan since 1951. In 1961, the Japan Broadcasting Corporation founded a correspondence school to study and perfect techniques of radio and television integration with correspondence education. The school, as described by Schramm (1967), consists of a four year high school course including radio (or television) broadcasts, textbooks, workbooks, papers and reports to be submitted, and a special twenty-day per year in-school session. Formal evaluation has been limited but results seem to indicate that the broadcast correspondence school is at least as effective as normal school.

Ewing (1967) discussed the two forms of educational radio used in New Zealand. The first is an adjunct to the regular correspondence school and the second is a series of regular school broadcasts. Although no formal evaluation has been done there to assess the effects of radio, students from the correspondence schools do well when they transfer to regular schools, and informal reports from parents and teachers indicate that radio is effective as used in the regular school system.

The role of radio in Australia's correspondence schools, as a supplement in the regular schools, and the radio university are described by Kinane (1967). 95% of Australian schools have radio facilities and make use of some of the thirty different weekly programs. The programs are coordinated with the regular curriculum and the correspondence school.

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There has been no formal evaluation of radio's effects in either the correspondence school or the regular school but they are considered generally helpful.

The Radio University operated by the University of New South Wales offers graduate studies, professional non-credit courses, general interest courses, and a college preparatory program. In addition to regular radio broadcasts, tapes of the series are available. The broadcasts are supported by printed notes and a seminar held at the university at the end of each course sequence.

Other International Examples

Brazil is engaged in a project (Minerva Project) to supplement the work of the regular educational systems by providing education for adolescents and adults (Medici, 1972). The project is designed to reach all levels of education, and has a broad pedagogical and professional orientation. In addition to individual use, the project has organized groups of twenty-five to thirty students under the direction of a monitor and has provided supplementary written material for group use.

Funtan-Pueyo (1971) suggested some possible uses for instructional radio in Venezuela. His study focused on applications of radio as part of a multimedia program including television and filmstrips in adult education and family planning.

Experiments have been conducted in Africa on the instructional uses of radio. Inquoi (1964) reported that Ethiopia has experimented with

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radio as an aid in general community education. The project included literacy training for adults, information on health and agriculture, and entertainment for adults and children. Dahomey's educational radio project, which is being assisted by the Office de Cooperation Radiophonique, Paris, was described by Tevoedjie (1969). The article outlines the project's current programs and its plans for future expansion.

Griffith (1967) reported that the government of Malawi has supported the development of educational radio. Facilities are limited and attempts are being made to make the system self-supporting. Programming centers on agriculture, rural development, public health, literacy, adult and formal education. Problems include lack of suitable equipment and lack of receivers among the native population.

LeFranc (1967) reported that radiovision is used as part of a large literacy program in Niger. There has been no formal evaluation of the program and no assessment of the effects of the radiovision segment. However, between fifty to sixty percent of the students who begin the program finish and gain the ability to read and write in their vernacular, count and do basic arithmetic, and speak elementary French.

Ruiz (1971) described a Spanish experiment designed to encourage small rural townships to develop an interest in their cultural heritage.

A study of radio as a solution to some of Jordan's educational problems was conducted by Alami (1965). The objectives of the study were to locate, describe, and analyze the major educational problems and needs of the Jordanian educational system which could be alleviated

by the establishment of a national in-school radio service.

The Cyprus Broadcasting Corporation was described by Christofides (1969), in terms of the laws and regulations which brought it into being. He defined its activities and the provisions for its financial support. Special attention is given to the relationship between the corporation and the Ministry of Education, who jointly produce educational radio and television broadcasts on a regular basis.

Radio Research

Attitudes and Psychological Implications

While not directly related to education, much can be learned from research on commercial radio that focuses on listeners' attitudes. Link and Corby (1939) collected evidence which showed that the size of radio audiences was not a reliable measure of the effectiveness of the program in selling a product.

They summarized many radio advertising studies made by the Psychological Corporation revealing primary emphasis on the qualitative rather than quantitative aspects of radio programs. This emphasis has usually included a measure of the extent to which the program stresses desirability of the product upon the mind of the listener, and a measure of the extent to which these impressions are being converted into new customers. Another study done by Psychological Corporation in 1933 compared the relative effectiveness of four important media - radio, newspapers, magazines and billboards. In some product areas radio

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appeared to be the most effective medium. Other studies of radio audiences indicated that when popularity of the various programs was computed, major differences were discovered between upper and lower income levels.

Link and Corby also gathered information about educational broadcasts. Their method was based on personal calls. The results showed that the more strictly educational stations had very small audiences, and the listeners designated as "educational" a substantial number of commercial programs which had hitherto been thought of primarily as entertainment.

For many practical purposes in radio research it is necessary to judge what radio means to different groups of people. Olbry and Smith (1939) developed an index of "radio-mindedness." They describe the procedure for deriving the index in detail, and show the consistency of the index. It was found that men are less radio-minded than women, and older people less than younger people. There exists a strong positive association between radio-mindedness and actual listening and a negative correlation between radio-mindedness and interest in cultural programs.

Roos and Heil (1939) measured listeners' attitudes toward a radio art appreciation course for college students. Illustrations of all the works of art discussed were printed in pamphlet form and were available to listeners upon request. For evaluation of the course a questionnaire was sent to approximately 750 people who had written for the pamphlet.

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125 questionnaires were returned by the listening group. Any interpretation made of the results involves a doubly selected group of listeners. The data indicated that the listening group seemed to like the broadcasts, but that not much had actually been learned as a result of the broadcasts. This inference may be documented by the relatively low percentage of desirable responses to questions of the objective type and the relatively high percentage of desirable scores on questions of the subjective type.

In order to obtain a more accurate evaluation of children's reactions to certain types of radio programs, a dictaphone was set up in a New York 5th grade classroom to record the pupils' actual comments during a classroom discussion. From the annotated excerpts, O'Brien (1941) concluded that in a literature radio series, children want good stories, accurate portrayals, adherence to the plot, plots which have depth and are well organized, good diction, good sound effects, and good background music.

Henderson (1968) conducted an opinion survey of high school mathematics teachers in Wisconsin on the basis of one fifteen minute broadcast. Comments on fifty-nine returned questionnaires indicated that the broadcast was successful because of the quality of the experimental program. All fifty-nine teachers answered "yes" to the question, "Do you feel that future radio broadcasts can be of value to you during your teaching high school students the subject matter of mathematics? "

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Britt (1938) emphasized two principles in educational broadcasting; those principles of the learning-remembering process which are inherent in any type of educational situation, and those factors of learning-remembering which are peculiar to radio education and differentiate it from classroom education.

Obviously, there are fundamental differences in "mental set" between classroom listeners and radio listeners. A multitude of other factors differentiate a known, visible, and rather homogeneous classroom of students from a group of unknown, invisible, and heterogeneous listeners. Also, polarization toward the speaker is very limited in educational broadcasting. Britt suggested that radio educators camouflage the program somewhat with materials high in entertainment value and sustain interest by encouraging listeners to take notes and send in questions.

Robinson (1940) presented a preliminary report on factors in radio listening after investigating a large-scale factor analysis of program preferences with 146 Princeton University students for eighteen types of radio programs. The eighteen kinds of programs produced three factors. The programs with a significant loading on the first factor either emphasized or directly involved drama of some kind. The second factor was more difficult to see. As a rather wild speculation, it was named as an "inspirational" factor, involving awakening, quickening, a sense of the meaning of things. The third factor was not large enough even for speculative purposes.

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Nias and Kay (1954) reported an experimental study concerning immediate memory of a broadcast feature program. The aims of the experiment were to find out how much of a lengthy feature program could be remembered shortly after being heard, to examine how remembering differed for various types of material, and to relate this remembering to the intelligence, occupation, age, and sex of the subjects.

After playing a record of a half-hour program which presented information about the legal rights and responsibilities of innkeepers, the group of eighty-one subjects completed a short questionnaire which was followed by a brief discussion. Thirty specific questions were answered and a fifteen-minute intelligence test was taken. Eighty percent of the answers on the story were accurate and fifty percent of the legal points and trivial details were correct. The group with the highest intelligence test score, scored 70% on law and trivial questions, and the lowest group scored 20%. The range among groups was limited for the story items; from ninety to seventy percent. There was no difference in the scores of men and women.

Experiments by Allport (1935) involved a comparison of the mental processes of an audience listening before the radio and of the same audience when it is in the physical presence of the broadcast. Two equivalent small audiences of six persons each were used. One audience sat before the broadcaster, while the other audience received the broadcast in another room. The subjects in these two situations were administered

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tests for several mental processes and abilities. The chief difference between these controlled experimental situations was the absence of emotional appeal for the loudspeaker group. Results indicated that the face-to-face situation seemed to have a facilitating effect upon attention and mental work.

Hartlage (1936) investigated the differences in listening comprehension of the blind and sighted. Fifty blind and fifty sighted high school students in various states, matched according to age, sex, and intelligence with the aid of several tests, listened to a recorded prose selection. When tested for comprehension of material, no statistically significant differences were found between the groups, however, the variable of intelligence for both groups correlated highly with comprehension scores.

Effectiveness

Available data on radio as an instructional device indicate that it can be highly effective. Studies have been carried out in classrooms with radio playing varying degrees of importance, in industrial and vocational education, in career education, in professional education, as an aid in community development projects, and as a motivational aid.

To find out the types of lessons or demonstrations that can be presented successfully by radio to pupils, Dickson (1924) carried out an experiment involving eight lessons for 7th through 10th graders. Dickson's primary purpose was to investigate the possibility of radio programming as a supplementary service in addition to classroom teachers. The results

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were positive and Dickson suggested that through radio it would be possible to plan for more effective use of standard tests and measurements. A period of twelve to fifteen minutes seemed to be about the maximum time that instruction should be given without some break.

The Chicago public schools, through the Chicago Radio Council, broadcast to schools each week nine fifteen-minute radio programs. Reid (1940) evaluated the effectiveness of the above series in achieving certain educational objectives. The experiment was designed to answer the question, "To what extent does the series of programs, plus the teachers' utilization of them in the classroom, stimulate reading interest?"

Changes in reading interests in terms of amount of reading and writing ability were measured by a reading interest questionnaire administered to the students before and after the experimental period. The series of radio programs failed to increase reading interests. The author stated that one of the reasons for this result may have been that the experimental period of six weeks was too short a time in which to expect changes. However, the series of programs did stimulate the students to read more books.

The St. Louis Vocabulary Development Project was developed to help children cope with the increasing vocabulary demands in content areas encountered in the 4th through 6th grade. Reports by Kottmeyer (1970) and the St. Louis Public Schools (1971) indicated that: 1) the project

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had positive effects on measured achievement growth in general vocabulary and spelling, and on reading achievement and intelligence, 2) the effects on achievement variables were greatest for students in predominantly black schools, and 3) teachers favored the project.

In 1965, ten Negro and Puerto Rican girls received clerical training for eight weeks using Gregg audio materials adapted to a machine technology. In the preliminary report of the prototype system of simultaneous, multi-level, multiphasic audio programming, Adams (1968) suggests the feasibility of FM radio broadcasts for reducing costs by making training available to large numbers of trainees.

The National Institute of Health (1970) used radio as a recruitment tool for the health occupations. They hypothesized that the broadcasting approach would better attract students, particularly minority students, to a professional career.

Eleven science classes, in high schools having large percentages of minority students, participated in the San Francisco area. The students participated in two-way radio broadcasts with a radio lecture followed by a question and answer period.

Although attendance figures and other statistical data were incomplete, the project staff reported that the programs were extremely effective in producing initial interest and enthusiasm in both students and counselors, and in giving minority students a feeling of being needed and wanted in the health professions.

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The Department of Postgraduate Medicine of the Albany Medical College in New York (1967), with government support, investigated whether knowledge and skills of practicing physicians in solving diagnosis and treatment problems were affected by two-way radio instruction. Developed as an instructional and data-collecting device, the new radio instruction has been designated a "Diagnosis and Treatment Conference."

For the analysis of the project 7,315 doctors who participated in the Albany network presentation, were pre and post-tested on twenty diagnosis problems. The data indicates significant improvement and that the practicing physician performed better on the tests than the resident and intern. Those physicians working in a hospital with a bed capacity of one hundred of less showed the greatest improvement in diagnostic ability.

Early (1972) provided a full description of the broadcasting and operation of WHRS-FM which serves migrant workers and their children. The goal of the project was to evaluate FM radio as a solution to the serious problem of communicating with the migrant family. Specific aims included reducing children's absenteeism and increasing the participation of the family in school-related activities.

Radio education was given to children and adults at different times. Comparative data about absenteeism and test scores were maintained for a control group in 1969-70 and measured against the data for 1970-71. Dairy information about students' and adults' participation in broadcasting

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and learning achievement was provided by teachers. Children and adults both showed interest in the radio education program and average daily attendance of students showed a definite increase.

The Workers' Educational Association and the BBC local radio station in Liverpool jointly prepared an educational radio series for working class adults. Jones and Lovett (1971) described the setting, conduct, and results of this research project.

The project was conducted under the hypothesis that cultural education by radio can help adults who have not had good experience in School. The objectives for the series were an extension of vocabulary, critical awareness, and the use of concepts and action. Reports from tutors indicated that the vocabulary building objective had been generally achieved in all the groups and that critical awareness was achieved in some cases. Several of the tutors commented that their groups were so unfamiliar with the subjects that they lacked the confidence to express their ideas which might have ultimately led them toward the perception of the concepts.

The student radio station at Morehead State University in Kentucky (1970) conducted a community service and continuing education project through broadcast utilization. The major emphasis was to determine to what extent the senior citizen, through visits and radio broadcasts, could be motivated to improve his cultural and educational aspirations. The programs were designed for retired teachers and business and

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professional people. The reactions to the radio broadcasts were solicited in informal interviews with participants. Evaluative comments were not entirely favorable, although a series on music and a "talkback" series were well received. The project, in general, was found to have significant positive impact.

Edward and Peek (1970) investigated radio listening to reinforce operant responding. Four conjugate contingencies were used: contingent listening, contingent removal, free listening, and no listening. Results indicated that radio can act as an effective reinforcing event.

Comparisons of Radio with Other Media

In addition to studies evaluating radio's effectiveness as an instructional device, comparisons have been made of performance achieved with radio instruction and performance using traditional classroom or other media methods.

McLuhan (1964) discussed differences between TV and radio.

> In a group of simulcasts of several media done in Toronto a few years back, ... four randomized groups of university students were given the same information at the same time about the structure of preliterate languages. One group received it via radio, one from TV, one by lecture, and one read it. For all but the reader group, the information was passed along in straight verbal flow by the same speaker without disucssion or questions or use of blackboard. Each group had half an hour exposure to the material. Each was asked to fill in the same quiz afterward. ... The students performed better with TV - channeled information and with radio than they did with lecture and print - and the TV group stood well above the radio group.

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> Since nothing had been done to give special stress to any of these media, the experiment was repeated with other randomized groups. This time each medium was allowed full opportunity to do its stuff. For radio and TV, the material was dramatized with many auditory and visual features. The lecturer took full advantage of the blackboard and class discussion. The printed form was embellished with imaginative use of typography and page layout to stress each point in the lecture. All of these media had been stepped up to high intensity.
>
> Television and radio once again showed results high above lecture and print. Unexpectedly to the testers, however, radio now stood significantly above television. It was a long time before the obvious reason declared itself, namely that TV is a cool, participant medium. When hotted up by dramatization, ... it performs less well because there is less opportunity for participation. Radio is a hot medium. When given additional intensity, it performs better....
>
> A cool medium, whether the spoken word or the manuscript or TV leaves much more for the listener or user to do than a hot medium. If the medium is of high definition, participation is low. If the medium is of low intensity, the participation is high.... Because the low definition of TV insures a high degree of audience involvement, the most effective programs are those that present situations which consist of some process to be completed....

William, Paul, and Ogilvie (1957) conducted a study on retention in relation to four different media. They presented the same abstract lecture simultaneously to a TV studio audience, on TV, on radio, and in print to four groups of college students matched for grade average. Each group took a thirty-minute multiple-choice examination immediately after the lecture and again eight months later. TV, radio, and reading ranked in that order of effectiveness and the order was unchanged eight months later. Those in the studio did no better than the reading group.

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Gaskill (1933) conducted an experiment to determine the relative effectiveness of broadcasting and lecturing to college students. Two 21-minute talks were broadcast to two groups of sixty-five college students at one week intervals. For the first talk, Group A listened to the speaker at the studio and Group B listened by means of their own radio receiver on an individual basis. For the second talk, the groups exchanged positions. Three days after each of the two talks all of the subjects were given an objective examination. The same examinations were given to three classes of persons who did not hear the talks. Scores on the examinations indicated a small but significant superiority for the broadcasting group. Every individual had a higher score on the examination following a radio presentation than on the examination following a studio lecture.

Cook and Nemzek (1939) reported a study measuring the educational value of instructional radio programs for intermediate school pupils. 8th and 9th graders were taught using fifteen educational programs on local radio stations. Another group with similar characteristics was taught the same lessons but not permitted to listen to the broadcasts. From pre and post-test data the authors concluded that lessons taught by means of radio effect definite changes in pupils, and that the radio certainly should be used as an instructional device.

Miles (1940) investigated the effectiveness of radio programs as a supplement to classroom science teaching. Ten pairs of classes, five from the 5th grade and five from the 6th, were selected with each pair

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approximately alike in intelligence, reading ability, age, and sex. The differences in mean gains of the radio and non-radio classes were examined by grade level and sex. The mean scores of the radio classes showed that a significant increase in information and a significant shift in attitudes occurred during the semester, and that the radio classes which spent the most time in utilizing the broadcasts were the only radio classes showing a gain in interests.

Barr, Ewbank, and McCormick (1942) reported the results of a Wisconsin research project in school broadcasting for grades 5 through 8. Objective findings yielded mixed results with few of the differences between radio and control groups statistically significant. Subjective data from questionnaires, letters, and interviews favored the radio lessons. Evidences of continued interest included increased enrollment, purchase of teacher's manuals, and requests for extension of radio facilities.

Rothney and Hansen (1947) reported a University of Wisconsin exploratory study conducted with 446 experimental and 403 control children to determine the effects of a radio program designed to teach children to recognize the basic value of the individual, to judge people by their own merits, and to overlook differences of race, religion and color. The data indicates that 97% of the pupils liked the broadcasts, 75% of the teachers thought that the program produced better pupil thinking and action, factors such as race, nationality, religion, or economic status were not important in the pupils' choice of the radio characters as friends, and that there were significant differences between

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listening and non-listening groups of pupils in favorable attitudes toward members of groups other than those of which they were a part. The authors stated that measuring devices were crude and lacked subtlety. Also, there were no longitudinal data from which we might discover trends in the development of attitudes.

The effects of high frequency AM radio on learning of structural drills in Spanish were studied by Cook (1964). Personal receivers for each student were used. The broadcast consisted of Spanish drills and a limited amount of text material programmed in a stimulus-response pattern. Several measuring instruments were employed. The experimental group was given considerably more drill and did better on tests, however, there was no true control group since it received some of the experimental treatment.

Uslan (1965) used short wave radio broadcasts to teach geographic and related physical science concepts to 5th grade students. The experimental group achieved significantly higher post-test scores than a control group.

Garfinkel (1970) studied the effects of an enrichment oriented radio program in high school Spanish courses. His experimental groups consisted of students listening to the radio broadcast and students who listened to a tape of the broadcast. There was a control group which received neither audio input. The programs were broadcast for two semesters. Results of post-testing showed no significant differences

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between the groups in listening comprehension and barely significant differences in attitude.

Banister (1970) compared the effectiveness of two American history courses for college students taught by different multimedia methods. For one group of students the instruction consisted of taped lessons accompanied by filmstrips, student response sheets, and seminars. The experimental group received thirty-minute FM broadcasts three evenings a week, which were supplemented by illustrated printed syllabi. The latter half of each program was devoted to a group discussion at which time the instructor would discuss the contents of the program while the students phoned in questions. Both groups had textbooks and other reading assignments.

Despite all efforts to publicize the course, initially only seventeen individuals enrolled for the radio course, and only five of these students completed the course. Evaluation instruments included three objective question tests, two mid-term tests, and one final test.

This study, though limited by the small size of the population, demonstrated that radio broadcasts with printed illustrations and student response sheets was as effective as an on-campus multimedia program utilizing tapes, film-strips and student response sheets.

Taylor (1972) conducted a radio program devised to assist regular classroom teachers, in four elementary, three junior high, and three senior high schools, using a total of 274 students, to improve the

communication skills of the students. This investigation attempted to determine the motivational capability of the radio when used as a reinforcement stimulus in the classroom, and to determine whether or not radio could be utilized to improve communication skills.

All of the subjects were attending schools in deprived neighborhoods in Washington, D. C. The subjects were divided in an experimental group of 180 pupils and a control group of 94 pupils. The program consisted of broadcasting four different sound programs to the four grade levels. Results of a semantic differential scale administered to the experimental groups of students on variables of attitude and judgment toward the overall radio broadcast were summarized. Besides the scale, questionnaires, interviews, and classroom observation forms were completed.

The data suggested that the broadcasts generated an enormous amount of interest among students. There was an important variation among the groups characterized by a more intense involvement at the senior high level and less involvement at the primary level as the program proceeded.

Maximizing Effectiveness and Needed Research

Most of the history of radio research reflects little emphasis on maximizing a radio broadcast's impact. There is a need for careful study of what factors make some instructional radio programs effective, others mildly effective, and some outstanding.

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Jay and Middleton (1941) discussed some of the problems encountered in developing a radio research laboratory. They criticized research on the psychological problems of radio because of poor laboratory conditions. A model of a radio laboratory designed to overcome some of these problems was presented.

Tyler (1937) suggested four major functional areas of research in classroom broadcasting. The first concerns the outcomes of classroom broadcasting and what we may expect to be accomplished. The second area involves the means of facilitating the outcomes to be achieved. Research in evaluation in relation to school broadcasting is the third field. The final area is that involving the coordination and selection of facilities for making effective use of radio. Several research studies are discussed, but lack of adequate data in all these fields, particularly in relation to evaluation, is retarding progress in school broadcasting. Unfortunately, in the ensuing thirty-six years, little has been done toward answering Tyler's questions.

Costs

One of the best reviews of the costs involved in an educational radio project is included in a book summarizing an extensive UNESCO project to study educational media worldwide (Schramm, Coombs, Kahnert, and Lyles, 1967). The review includes initial costs, relationships between costs and amount of use, unit costs, production costs, and examples of methods for reliably estimating expenditures. Estimates

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for initial investment range from $100,000 if existing facilities are limited, to $25,000 to $50,000 if existing facilities can be extensively used. Comparable figures for educational television range from $38,000 to $8,000,000.

Unit costs for school broadcasts where radio provides a substantial part of the educational program can be as low as one to two cents per pupil-hour. This compares to five to fifteen cents per pupil-hour with television. Jamison and Klees (1973) reported cost data on eight different projects involving media. These include five television and three radio projects. The costs per student-hour for radio ranges from $.0041 which is estimated for Indonesia, to $.058 for Mexico. Radio forums in Togo (152 forums) cost thrity-two cents per listener-hour. With 1,000 forums, the cost for forums in Togo is estimated to drop to six cents per listener-hour. India with 2,000 forums spends nine cents per listener-hour. In Japan, where the average annual cost per secondary school pupil is about $349, the cost of correspondence-plus-radio is estimated at $91 per pupil per annum. Correspondence-plus-television is estimated at $148 per pupil per annum.

Sovereign (1969) conducted a careful analysis of factors affecting costs of media uses in instructional settings.

Bourrett (1971) presented arguments in favor of radio over television as a low cost alternative for reaching rural areas. He cited the fact that installation and programming costs for television are three to five times that of radio.

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Certainly there is agreement that radio costs considerably less than television and less than traditional classroom instruction. If the audience for the radio broadcasts is sufficiently large then the costs for development of the radio lessons can be spread over these listeners to get a low per person cost.

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Abell, H. C. Farm Radio Forum Project - Ghana, 1964-65. 1968. (ERIC ED016-151)

Accion Cultural Popular (ACPO). Radio Schools, Document #20. Bogota, Colombia, 1972.

Adams, C. F. Training Typists - A Prototype System. 1968. (ERIC 013-428)

Alami, A. F. A Study of the Educational Problems in Jordan as a Basis for the Establishment of a National In-School Radio Service. (Doctoral dissertation, Syracuse University) Ann Arbor, Michigan: University Microfilms, 1965, No. 63-3640.

Albany Medical College. Development, Utilization, and Evaluation of Graduate Education by Two-way Radio. Albany, New York. 1967. (ERIC ED 017-189)

Allport, G. W. Psychology of Radio. ARNO: New York. 1935.

Ball, J. C. H. Beginning Sciences: A Radio Series for Primary Schools in Africa. Educational Broadcasting International, 1971, 5, 79-82.

Bannister, R. E. Comparison of Two History Instruction Methods. 1970. (ERIC ED 032-783)

Barr, A. S., Ewbank, N. L., and McCormick, T.C. Radio in the Classroom; Experimental Studies. University of Wisconsin Press, Madison. 1942.

Bourrett, P. Television in Rural Areas: A Low Cost Alternative. 1972. p. 31. (ERIC ED055-451)

Britt, S. H. Learning and Remembering in Educational Broadcasting. Education. 1938, 59, 169-175.

Burrow, T., Somerton, M., Williams, N., and Whittingham, T. An Experiment in Local Radio. Adult Education (British). 1969, 42.

Cassier, H. R. Two-way Radio in Rural Senegal. Educational Television International. 1970, 148-149.

Cook, H. R. The Effects on Learning of Instructional Drills in Spanish Broadcast via High Frequency AM Radio. Research in Education. 1964. (ERIC ED 003-193)

Cook, D. C., and Nemak, C. L. The Effectiveness of Teaching by Radio. Journal of Educational Research, 1939, 33, 105-110.

BEST COPY AVAILABLE

Corporation for Public Broadcasting - Public Broadcasting Environment Center, Final Report. Washington, D. C. 1970.

Cosford, R. H. Radiovision. Educational Television International, 1969, 2, 298-304. (ERIC ED 027-761)

Cristofides, A. The Structure and Activities of the Cyprus Broadcasting Corporation. European Broadcasting Union Review. 1969, 116, 16-19.

DeFever, A. Radio in Agricultural Extension in Developing Countries. Educational Television International. 1971, 4, 124-27.

Dickson, V. E. Radio in Oakland Schools. Journal of the National Education Association. 1924, 13, 279-282.

Dreyfus, L. S. Enrichment through Radio and Television. Bulletin of National Association of Secondary School Principals. 1966, 50, 111-115.

Early, L. F. FM Radio: An Oral Communication Project. Palm Beach County (Florida) Board of Public Instruction, 1972. (ERIC ED 061-739)

Edward, J. S., and Peek, V. Conjugate Reinforcement of Radio Listening. Psychological Reports. 1970, 26.

Educational Technology. A Selected Bibliography on Educational Radio. Educational Technology. 1969, 9.

European Broadcasting Union International Conference on Educational Radio and Television, Paris, March, 1967. (ERIC ED 028-641)

Fiske, M., and Lazarfeld, P. F. The Office of Radio Research: A Division Bureau of Applied Social Research, Columbia University. Educational Psychological Measurement, 1945, 5, 351-369.

Forsythe, R. O. Instructional Radio: A Position Paper. ERIC Clearinghouse on Media, Stanford University, 1970. (ERIC ED 044-933)

Funtan-Pueyo, J. A Review of Adult Educational Health Needs in Venezuela and the Possible Uses of Instructional Radio. (Doctoral Dissertation, Michigan State University) Ann Arbor, Michigan: University Microfilms, 1971, No. 71-18202.

BEST COPY AVAILABLE

Garfinkel, A. Effects of An Enrichment-Oriented Radio Program on Measures of Listening Comprehension and Student Attitudes in High School Spanish Courses. (Doctoral dissertation, Ohio State University) Ann Arbor, Michigan: University Microfilms, 1969, No. 70-14023.

Gaskill, H. V. Broadcasting vs. Lecturing Psychology; Preliminary Investigation. Journal of Applied Psychology. 1933, 17, 317-319.

Griffith, B. L. The Malawi Broadcasting Corporation. NAER Journal. 1967, 23, 64-70.

Guarrera, S. Active Participation of Italian Pupils in School Radio Programmes. European Broadcasting Union Review. 1972, 23, 10-14.

Hartlage, L. C. Differences in Listening Comprehension of the Blind and the Sighted. International Journal for the Education of the Blind. 1963, 13, 1-6.

Henderson, G. L. Mathematics via Radio in Wisconsin. The Mathematics Teacher. 1968, 59, 56-62.

Hilliard, R. L. Educational Public Broadcasting. Speech presented at meeting of College Conference on International Radio and Television Society, 1968. (ERIC ED 064-914)

Hindley, M. P. Neighborhoods of the Air. Paper presented at the International Communication Association Annual Convention. Atlanta. 1972.

Hulsen, A. L. Radio Education in Korea. Educational Broadcasting Review. 1967, 1, 43-46

Inquoi, S. Application of Radio in Community Education in Ethiopia. (Doctoral dissertation, Ohio State University) Ann Arbor, Michigan: University Microfilms, 1963, No. 64-1268.

Jain, N. C. An Experimental Investigation of the Effectiveness of Group Listening, Discussion, Decision, Commitment and Consensus in Indian Radio Forums. (Doctoral dissertation, Michigan State University) Ann Arbor, Michigan: 1969, No. 69-16149.

Jamison, D. Satellite Systems for Instructional Radio. #AD-673-829, Rand Corporation: Santa Monica, California, 1969.

BEST COPY AVAILABLE

Jamison, D., Suppes, P., and Wells, S. The Effectiveness of Alternative Instructional Media: A Survey. Technical Report #196, Institute for Mathematical Studies in the Social Sciences, Stanford University. 1972.

Jay, P. J., and Middleton, W. C. The DePauw Laboratory for Research on the Psychological Problems of Radio. American Journal of Psychology. 1941, 54, 571-575.

Jones, R. and Lovett, T. Living Today: BBC Local Radio Education. 1971. (ERIC ED 064-602)

Kinane, K. Australia's Correspondence Schools with Supporting Broadcast Programmes. New Educational Media in Action, UNESCO. 1967.

Koomsai, M. T., and Ratanamangkala, P. Educational Radio in Thailand. New Educational Media in Action, UNESCO. 1967.

Kottmeyer, W. Radio in Language Growth for Study and Discussion. St. Louis (Mo.) Public Schools. 1970.

Land, H., Associated, Inc. The Hidden Medium: A Status Report on Educational Radio in the United States. Land Associates: New York. 1967.

LeFranc, R. A. Educational Media in Franca. AV Communications Review. 1963, 4, 271-276.

Link, H. C., and Corby, P. G. Studies in Radio Effectiveness by the Psychological Corporation. Journal of Applied Psychology. 1940, 24, 749-757.

Lynch, J. E. Radioand Television in the Secondary School. National Association of Secondary School Principals: Washington, D. C. 1966.

Mackie, R. Citizen's Forum: Its Origin and Development 1943-1963. Unpublished thesis. Toronto University, 1968.

Madden, R. Educational Radio Bibliography. Educational Broadcasting Review, 1968, 2, 66-79.

McLuhan, M. Understanding Media: The Extension of Man. New York: McGraw-Hill, 1964.

BEST COPY AVAILABLE

Miles, J. R. Radio and Elementary Science Teaching. Journal of Applied Psychology, 1940, 24, 714-720.

Morehead (Kentucky) State University. A Community Service and Continuing Education Project through Broadcast Utilization. July, 1970. (ERIC ED 036-686)

National Institute of Health. "Graduate, then what? Jobs in Health." A Report on the Use of Radio as a Recruitment Tool for Health Occupations. Bethesda, Maryland. 1970.(ERIC ED 050-230)

Nias, A. H. W. and Kay, H. Immediate Memory of a Broadcast Feature Programme. British Journal of Educational Psychology. 1954, 24, 154-160.

O'Brien, M. I Listen to Children; A Study of the Use of A Literature Radio Series. Teacher's College Record. 1941, 42, 619-634.

Olbry, F., and Smith, E. An Index of Radio-Mindedness and Some Applications. Journal of Applied Psychology. 1939, 23, 8-18.

Reid, S. Reading, Writing and Radio A Study of Five School Broadcasts In Literature. Journal of Applied Psychology. 1940, 24, 703-713.

Riitho, V. Radio in Family Planning Education in Africa. Educational Broadcasting International. 1971, 5, 243-245.

Robinson, W. S. Preliminary Report on Factors in Radio Listening. Journal of Applied Psychology. 1940. 24, 831-837.

Roos, F. J. and Heil, M. Measuring the Listener's Attitude Toward a Radio Art Appreciation Course. Journal of Applied Psychology. 1939, 23, 75-85.

Rothney, J. W. M., and Hansen, M. H. Evaluation of Radio Instruction in Inter-Cultural Relations. Journal of Experimental Education. 1947, 16, 101-121.

Ruiz, A. A. A New Spanish Experiment in Cultural Education. European Broadcasting Union Review. 1971, 125b, 16-18.

Sandler, J. Educational Radio: "the Hidden Medium" Emerges. AV Instruction. 1967, 12, 964-967.

Schramm, W. Educational Media in Action. UNESCO: Paris, 1967.

BEST COPY AVAILABLE

Schramm, W., Coombs, Kahnert, and Lyles. The New Media: Memo to Educational Planners. UNESCO: Paris, 1967.

Sitram, K. S. An Experimental Study of the Effects of Radio Upon the Rural Indian Audience. (Doctoral Dissertation, Oregon University) Ann Arbor, Michigan: University Microfilms, 1969, No. 16-685.

Sovereign, M. G. Costs of Educational Media Systems: An Occasional Paper. ERIC Clearinghouse on Media and Technology, 1969.

Sparks, K. R. A Bibliography of Doctoral Dissertations in Television and Radio. Newhouse Communications Research Center, Syracuse (New York) University. 1971.

St. Louis Public Schools. Vocabulary Development Project, Evaluation Report #2. St. Louis, Mo. 1971.

Taylor, G. Radio: An Experiment in Communication Skills. AV Guide, May, 1972, 12-15.

Tevoedijie, T. An Education Campaign by Radio in Dahomey: First Report. European Broadcast Union Review. 1969, 114b, 35-37.

Tyler, I. K. "Needed Research in Classroom Broadcasting." in Educational Broadcasting, 1936. C. S. Marsh (ed.). University of Chicago Press, 1937, 377-385.

UNESCO. Cultural Radio Broadcasts; Some Experiences. Paris, 1956.

UNESCO: IIEP. Radio and Television in the Service of Education and Development in Asia. Report #49. Paris, 1967.

Uslan, D. T. A Study of Geographic and Related Physical Science Concepts and Understandings Attainable through the Media of School Radio Communication. (Doctoral dissertation, UCLA) Ann Arbor, Michigan: University Microfilms, 1965, No. 65-3900.

Wagner, I. F. Current Radio Research in Universities. Journal of Applied Psychology. 1939, 23, 192-206.

Walker, W. H. Organizing for Education (AAAS). A paper presented at the International Conference on Arid Lands in a Changing World. June, 1969.

Williams, D. C., Paul, J., and Ogilvie, J. C. Mass Media, Learning and Retention. Canadian Journal of Psychology. 1957, 2, 157-163.

Young, E. L. Public Radio in the Seventies. Educational Broadcasting Review. 1970, 4, 47-52.